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EDWARDS & ANGELL, LLP
P.O. Box 55874
Boston, MA 02205

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| EXAMINER |
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SHEN, KEZHEN

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2627

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03/04/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/824,926

Applicant(s)

TAJIMA ET AL.

Examiner

Kezhen Shen

Art Unit

2627

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11/1/2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-13,17 and 18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-13,17 and 18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1, 3-13, and 17-18 have been considered but are moot in view of the new ground(s) of rejection.

Regarding applicant's argument concerning "pits, corresponding to the recorded data, shorter than the resolution limit of an optical system in the reproducing apparatus", Examiner agrees the reference does not specifically teach the limitation of the equation of the pit to be less than the optical resolution limit calculated by $\lambda/(4NA)$, however one of ordinary skill in the art will appreciate the Tominaga et al. reference to teach a pit on a layer which can achieve a higher resolution limit than the optical resolution limit (Tominaga et al. Col 2 Lines 24-35). Examiner believes Tominaga et al. to teach the limitation of the pits being shorter than the optical resolution limit.

Regarding applicant's argument concerning, irradiation of a light beam from above the reproducing layer, Examiner disagrees to the applicant's argument. The Tominaga et al. reference teaches the limitation of a reproducing light above the reproducing layer. Since there is not a limitation concerning the specific orientation of applicant's claims, the Examiner understood the position of the light beam to be over on either side with a beam direction towards the disc (Tominaga et al. Fig. 2). Further, applicant argues the difference between the substrate and the protective layer. Tominaga et al. teach the two layers to be made of the same material (Tominaga et al. Col 6 Lines 45-50) and one of

ordinary skill in the art would acknowledge the functions of the two layers to be the same.

Drawings

2. Figures 7 and 8 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1 and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 1 and 17, Applicant claims *a recording layer for reproducing a signal from the pits*. Examiner believes this is indefinite because the recording layer does not reproduce signals, rather the recording apparatus or optical system converts the pits to information. To expedite prosecution the

Examiner will read the limitation as a recording layer, provided with pits for the reproducing apparatus to reproduce.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States. -

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 1, 3, 5-12 and 17-18 are rejected under 35 U.S.C. 102(b) as being unpatentable by Tominaga et al. 5,569,517.

Regarding claim 1, Tominaga et al. teach an optical data recording medium, in which irradiation of a light beam is used for reproducing recorded data, comprising a substrate having pits (10 and 21 of Fig. 2, Col 4, Lines 15-28), corresponding to the recorded data, which are shorter than a resolution limit of an optical system of a reproducing apparatus compatible with the optical data recording medium (Col 2 Line 24-35 Col 10 Lines 7-20 super-resolution is the ability to read an image beyond the diffraction limit resolution) and a reproducing layer for reproducing a signal from the pits (3 of Fig. 2 Col 4, Lines 25-28 the pits are within light transmittance control layer for carrying information), the reproducing layer being provided to face a light-incident surface of the substrate

(3 and 10 of Fig. 2 the light transmittance control layer and the protective layer are both in contact).

Regarding claim 3, Tominaga et al. teach the optical data recording medium as set forth in Claim 1, wherein the reproducing layer is made of a material whose transmittance changes in accordance with temperature (Col 2 Lines 52-67 Col 10 Lines 20-34 the crystal-to-crystal transition changes the irradiation of reading light and changes according to a predetermined temperature).

Regarding claim 5, Tominaga et al. teach the optical data recording medium as set forth in Claim 1 further comprising: a light absorption layer for converting the light beam to heat (Col 3 Lines 50-55 mask layer is heated by the light), the light absorption layer being contiguous to the reproducing layer (32 and 3 of Fig. 2, Col 4 Lines 20-25 the mask layer is apart of the light transmittance control layer therefore making the two layers contiguous).

Regarding claim 6, Tominaga et al. teach the optical data recording medium as set forth in Claim 1 further comprising: a reflective layer for reflecting the light beam (4 of Fig. 2, Col 4 Lines 29-35), the reflective layer being provided between the substrate and the reproducing layer (10, 4 and 3 of Fig. 2, Col 2 Lines 55-60).

Regarding claim 7, Tominaga et al. teach the optical data recording medium as set forth in Claim 1 wherein: the reproducing layer is made of a metal oxide (Col 7, Lines 49-55 SiO_2 and mixtures of SiO_2).

Regarding claim 8, Tominaga et al. teach the optical data recording medium as set forth in Claim 7, wherein: the reproducing layer is made of a zinc oxide (Col 7 Lines 49-55 while zinc oxide is not specifically disclosed as a material in the dielectric layers, it is well known to one of ordinary skill in the art the interchangeable use of silicon oxide and zinc oxide in dielectric layers in optical recording medium).

Regarding claim 9, Tominaga et al. teach the optical data recording medium as set forth in Claim 5, wherein the light absorption layer is made of one of silicon, germanium and an alloy of silicon and germanium (Col 3, Lines 13-16 disclose the mask layer preferably tellurium and germanium as main components).

Regarding claim 10, Tominaga et al. teach an optical data recording medium, in which irradiation of a light beam is used for reproducing recorded data, comprising a substrate having pits (10 and 21 of Fig. 2, Col 4, Lines 15-28), corresponding to the recorded data, which are shorter than a resolution limit of an optical system of a reproducing apparatus compatible with the optical data recording medium (Col 2 Line 24-35 Col 10 Lines 7-20 super-resolution is the ability to read an image beyond the diffraction limit resolution) a reproducing layer (3 of Fig. 2), stacked on a surface of the substrate on which the pits are provided (3 and 10 of Fig. 2 the light transmittance control layer and the protective layer are both in contact), the reproducing layer having a changeable transmittance with respect to the light beam (Col 2 Lines 52-67 Col 10 Lines 20-34 the crystal-to-crystal transition changes the irradiation of reading light and

changes according to a predetermined temperature), the changeable transmittance being changeable in accordance with intensity distribution of the light beam irradiated on the reproducing layer (Col 5 Lines 2-9); and a reflective surface (4 of Fig. 2, Col 4 Lines 42-47), provided between the substrate and the reproducing layer (10, 4 and 3 of Fig. 2), for reflecting a light beam having passed through the reproducing layer (Col 7 Lines 60-67).

Regarding claim 11, Tominaga et al. teach the optical data recording medium as set forth in Claim 10, further comprising a reflective layer provided between the substrate and the reproducing layer (4, 10 and 32 of Fig. 2, Col 4 Lines 32-35 reflective layer is interposed between the light transmittance control layer and the protective layer), and including the reflective surface (4 of Fig. 2, Col 4 Lines 32-35 reflective layer).

Regarding claim 12, Tominaga et al. teach the optical data recording medium as set forth in Claim 10, further comprising a light absorption layer, provided between the substrate and the reproducing layer (32, 3 and 10 of Fig. 2), for converting, to heat, the light beam irradiated thereon (Col 3 Lines 50-55 mask layer is heated by the light).

Regarding claim 17, Tominaga et al. teach a reproducing method of an optical data recording medium in which irradiation of a light beam is used for reproducing data recorded in the optical data recording medium, said optical data recording medium; including
a substrate having pits (10 and 21 of Fig. 2, Col 4, Lines 15-28), corresponding to the recorded data, which are shorter than a resolution limit of an optical system

of a reproducing apparatus (Col 2 Line 24-35 Col 10 Lines 7-20 super-resolution is the ability to read an image beyond the diffraction limit resolution) and a reproducing layer; for reproducing a signal from the pits (3 of Fig. 2 Col 4, Lines 25-28 the pits are within light transmittance control layer for carrying information), the reproducing layer being provided to face a light-incident surface of the substrate (3 and 10 of Fig. 2 the light transmittance control layer and the protective layer are both in contact), the said reproducing method comprising the step of irradiating the light beam from above the reproducing layer to reproduce the pits (Fig. 2 the reading light is above light transmittance control layer reading the pits Col 4 Lines 35-46).

Regarding claim 18, Tominaga et al. teach a reproducing method of an optical data recording medium in which irradiation of a light beam is used for reproducing data recorded in the optical data recording medium, said optical data recording medium including a substrate having pits (10 and 21 of Fig. 2, Col 4, Lines 15-28), corresponding to the recorded data, which are shorter than a resolution limit of an optical system of a reproducing apparatus (Col 2 Line 24-35 Col 10 Lines 7-20 super-resolution is the ability to read an image beyond the diffraction limit resolution) a reproducing layer; stacked on a surface, of the substrate, on which the pits are provided (3 of Fig. 2 Col 4, Lines 25-28 the pits are within light transmittance control layer for carrying information), the reproducing layer having a changeable transmittance with respect to the light beam (Col 2 Lines 52-67 Col 10 Lines 20-34 the crystal-to-crystal transition changes the irradiation of reading light and changes according to a

predetermined temperature), the changeable transmittance being changeable in accordance with intensity distribution of the light beam irradiated on the reproducing layer (Col 5 Lines 2-9) and a reflective surface, provided between the substrate and the reproducing layer (10, 4 and 3 of Fig. 2, Col 2 Lines 55-60) for reflecting a light beam having passed through the reproducing layer (4 of Fig. 2, Col 4 Lines 29-35), said reproducing method comprising the step of: reproducing said recorded data by irradiating a light beam on said optical data recording medium from above the reproducing layer (Fig. 2 the reading light is above light transmittance control layer reading the pits Col 4 Lines 35-46).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

10. Claims 4 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tominaga et al. 5,569,517 as applied to claim 1 above, and further in view of Jung 5,516,568.

Regarding claim 4, Tominaga et al. fail to teach the optical data recording medium as set forth in claim 1 wherein: at least a part of that surface of the

reproducing layer to which the light beam is irradiated is exposed to air.

However, Jung does.

Jung teaches the optical data recording medium wherein at least a part of that surface of the reproducing layer to which the light beam is irradiated is exposed to air (Jung 7 of Fig. 1, Col 4 Lines 47-48 an air layer). Therefore, taking the teachings of Tominaga et al. and Jung as a whole, one of ordinary skill in the art would be motivated to combine the teachings of an optical data recording medium and the teachings air layer for the benefit of an increase in the data density of the optical disc.

Regarding claim 13, Tominaga et al. fail to teach the optical data recording medium as set forth in claim 1 wherein: at least a part of that surface of the reproducing layer to which the light beam is irradiated is exposed to air. However, Jung does.

Jung teaches the optical data recording medium wherein at least a part of that surface of the reproducing layer to which the light beam is irradiated is exposed to air (Jung 7 of Fig. 1, Col 4 Lines 47-48 an air layer). Therefore, taking the teachings of Tominaga et al. and Jung as a whole, one of ordinary skill in the art would be motivated to combine the teachings of an optical data recording medium and the teachings air layer for the benefit of an increase in the data density of the optical disc.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kezhen Shen whose telephone number is (571) 270-1815. The examiner can normally be reached on Monday - Friday 8:30 am to 5:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dwayne Bost can be reached on (571) 272-7023. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kezhen Shen/



DWAYNE BOST
SUPERVISORY PATENT EXAMINER